

1. A method of making semiconductor device packages, comprising:  
forming a layered assembly by attaching a wafer to a dielectric layer;  
subsequently, testing semiconductor devices in said wafer; and  
subsequently, dicing said layered assembly.

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2. The method of claim 1, further comprising the step of connecting said  
semiconductor devices to input/output devices on the dielectric layer.

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3. The method of claim 2, wherein said testing is conducted through said  
input/output devices.

4. The method of claim 3, further comprising the step of discarding one or more  
defective packages.

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5. The method of claim 1, wherein said step of forming said layered assembly  
includes the step of adhering said wafer to said dielectric layer.

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6. The method of claim 5, further comprising the step of electrically connecting  
said semiconductor devices to ball grid arrays on said dielectric layer.

7. The method of claim 6, wherein said connecting step comprises the step of  
locating wire bonds in openings through said dielectric layer.

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8. The method of claim 6, wherein said connecting step comprises the step of  
connecting solder bumps on said wafer to circuit traces on said dielectric layer.

9. The method of claim 6, wherein said dicing step is performed by a saw.

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10. The method of claim 6, further comprising the step of providing a metal layer  
in said layered assembly.

Sub A.1  
11. A method of making semiconductor device packages, comprising:  
forming a layered assembly by attaching a semiconductor wafer and a metal layer to  
a dielectric layer;  
connecting semiconductor devices in said semiconductor wafer to ball grid arrays  
5 on said dielectric layer; and  
subsequently, dicing said layered assembly.

sub B.1  
12. The method of claim 11, wherein said forming step comprises the step of  
adhering said wafer to said metal layer.

10 13. The method of claim 11, wherein said connecting step comprises the step of  
locating wire bonds in openings in said dielectric layer.

15 14. The method of claim 13, further comprising the step of connecting said wire  
bonds to conductive traces on said dielectric layer.

15 15. The method of claim 11, wherein said connecting step comprises the step of  
connecting solder bumps on said wafer to conductive traces on said dielectric layer.

20 16. The method of claim 15, further comprising the step of connecting said traces  
to conductive vias extending through said dielectric layer.

17. The method of claim 11, wherein said dicing step is performed by a saw.

25 18. The method of claim 11, further comprising the step of testing said  
semiconductor devices through said ball grid arrays.

B' cont'd

19. A method of making semiconductor device packages, comprising:  
aligning a semiconductor wafer with respect to a dielectric tape;  
subsequently, connecting semiconductor devices in said wafer to ball grid arrays on  
said dielectric tape; and  
5 simultaneously dicing said wafer and said dielectric tape.

20. The method of claim 19, wherein said wafer is optically aligned with respect to  
said dielectric tape.

10 21. The method of claim 19, wherein said wafer is magnetically aligned with  
respect to said dielectric tape.

22. The method of claim 21, wherein oppositely charged magnetic elements are  
provided on said wafer and said tape.

15 23. The method of claim 21, further comprising the step of locating a magnetic  
ring in a charged slot.

24. A semiconductor device package, comprising:  
20 a semiconductor device having edges formed by a dicing operation;  
a dielectric substrate having edges formed by said dicing operation;  
a ball grid array on said dielectric substrate, said substrate being located between  
said semiconductor device and said ball grid array; and  
electrical connections between said semiconductor device and said ball grid array.

25 25. The package of claim 24, further comprising a metal layer having edges formed  
by said dicing operation.

30 26. The package of claim 25, wherein said metal layer provides a ground plane for  
said electrical connections.

27. The package of claim 26, wherein said semiconductor device is located between said metal layer and said dielectric substrate.

28. The package of claim 25, wherein said metal layer is arranged to dissipate heat from said semiconductor device.

29. The package of claim 25, wherein said metal layer comprises copper.

30. The package of claim 25, wherein said connections comprise wire bonds.

31. The package of claim 25, wherein said connections comprise conductive vias.

32. The package of claim 31, wherein said connections further comprise conductive traces on opposite sides of said substrate.

33. The package of claim 32, further comprising solder bumps on said semiconductor device, said bumps being connected to said traces.

34. The package of claim 24, further comprising an insulative solder mask for covering said dielectric substrate.

35. A method of handling a plurality of semiconductor devices arrayed in a semiconductor wafer, comprising:  
adhering said wafer to a flexible substrate;  
connecting said semiconductor devices to respective ball grid arrays located on said flexible substrate; and  
testing said semiconductor devices through said ball grid arrays.

36. The method of claim 35, further comprising the step of identifying defective packages.

37. The method of claim 35, further comprising the step of singulating packages from said wafer and said substrate.

38. The method of claim 37, further comprising the step of segregating defective  
5 packages from other packages.